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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,713	01/22/2007	Alwyn John Seeds	ZIN-001	6908

51414 7590 08/25/2010

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EXAMINER	
DOBSON, DANIEL G	

ART UNIT	PAPER NUMBER
2613	

NOTIFICATION DATE	DELIVERY MODE
08/25/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/538,713	SEEDS ET AL.	
	Examiner	Art Unit	
	DANIEL G. DOBSON	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *1-14,22 and 26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-21, 23-25, and 27-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 15-31 have been considered but are moot in view of the new ground(s) of rejection. To the extent Applicant's arguments apply to the current references, the examiner respectfully disagrees.

Cunningham discloses coupling optical radiation of the laser into the multimode optical fiber at an offset (Fig. 1, shows the multimode fiber (6), where radiation (20) is coupled into the fiber at an offset of X), the offset being selected to provide a stable operating regime for both amplitude and phase in the face of imperfections in the refractive index profile of the core (Fig's 4 and 5 show that an offset launch in the range of 20-30 um yields a bandwidth gain while avoiding excessive loss; Applicant's Specification (p. 8, ll. 19-20) states that the most stable region of operation is at an offset between 10 and 30 um; therefore, selecting an offset in the range disclosed by *Cunningham* achieves the claimed result of providing a stable operating regime for both amplitude and phase in the face of imperfections in the refractive index profile of the core.)

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 15-21, 23-25, and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,969,837 to Farber et al. and U.S. Patent 6,064,786 to Cunningham et al.

As to **Claim 30**, *Farber* discloses a method of supplying signals to a distributed antenna system having a multimode optical fibre link (Fig. 2, distributed antenna system with fiber (16); fiber (16) is a multi-mode fiber, Col. 4, l. 33), an input signal node (Fig. 2, base unit (10)) and an antenna (Fig. 2, antennas (26, 28, and 30), wherein the multimode optical fibre link comprises multimode optical fiber having a core (Col. 4, l. 33, multi-mode optical fiber (16) which inherently has a core), a laser to provide optical radiation for transmission over the multimode optical fiber (Fig. 4, laser diode (60) transmits over fiber (16)) and a photodetector arranged to receive optical radiation from the multimode optical fiber (Fig. 5A, photodiode (unlabeled) receives the optical signal from the multi-mode fiber), the method comprising:

supplying the input signal node with a radio-frequency electrical signal consisting of an information signal modulated onto a radio-frequency carrier (Fig. 3, GSM information signal is supplied modulated onto an RF carrier (935-960 MHz);

driving the laser directly with the radio-frequency electrical signal (Fig. 3, laser (60) is directly modulated);

transducing optical radiation from the multimode optical fiber into the radio-frequency electrical signal using the photodetector for radiation thereof by

the antenna (Fig. 5A, optical signal from base unit is converted to an RF signal which is passed to antenna (28.))

Farber does not expressly disclose using an offset launch.

Cunningham discloses coupling optical radiation of the laser into the multimode optical fiber at an offset (Fig. 1, shows the multimode fiber (6), where radiation (20) is coupled into the fiber at an offset of X), the offset being selected to provide a stable operating regime for both amplitude and phase in the face of imperfections in the refractive index profile of the core (Fig's 4 and 5 show that an offset launch in the range of 20-30 um yields a bandwidth gain while avoiding excessive loss; Applicant's Specification (p. 8, ll. 19-20) states that the most stable region of operation is at an offset between 10 and 30 um; therefore, selecting an offset in the range disclosed by *Cunningham* achieves the claimed result of providing a stable operating regime for both amplitude and phase in the face of imperfections in the refractive index profile of the core.)

At the time of the invention it would have been obvious for a person of ordinary skill in the art to use the offset launch technique disclosed by *Cunningham* in the distributed antenna system disclosed by *Farber*. The suggestion/motivation would have been to improve the bandwidth and modal noise performance of the multimode system (Col. 3, ll. 45-50.)

Farber and *Cunningham* are from the same art with respect to optical communication, and are therefore analogous art.

As to **Claim 15**, *Cunningham* discloses wherein the launch is collinear with an axis of the multimode fibre (Fig. 10.) The suggestion/motivation is the same as that used in the rejection for claim 30.

As to **Claim 16**, *Cunningham* discloses wherein the signal is provided by a transverse mode laser transmitter (Col. 8, l. 49.)

The suggestion/motivation is the same as that used in the rejection for claim 30.

As to **Claim 17**, *Cunningham* discloses wherein the launch comprises a single transverse mode laser (Col. 8, l. 49) coupled to a single mode fibre pigtail (Fig. 9, 2) in communication with a GRIN multimode fibre (Fig. 9, 6, Col. 7, ll. 20-25) using a mode-conditioning patchcord (Fig. 9, 2.)

The suggestion/motivation is the same as that used in the rejection for claim 30.

As to **Claim 18**, *Cunningham* discloses a laser receptacle package (Fig. 9, 2) coupled to a GRIN multimode fibre (Fig. 9, 6, Col. 7, ll. 20-25) where the axis of the optical output from a single transverse mode laser (Col. 8, l. 49) has been offset from that of the fibre (Col. 7, ll. 18-20.)

The suggestion/motivation is the same as that used in the rejection for claim 30.

As to **Claim 19**, *Cunningham* discloses wherein the multimode fibre has a core diameter of 62.5 um (Col. 7, ll. 12) and wherein the coupling step comprises using a launch having an offset distance measured from the centre of the

multimode fibre core to the centre of the optical radiation emitted from the transmitter of approximately 10 um to approximately 30 um (Fig's. 4 and 5 show that the offset can be changed as desired and includes the range from 10 um to 30 um.)

The suggestion/motivation is the same as that used in the rejection for claim 30.

As to **Claim 20**, *Cunningham* discloses where the offset distance measured from the centre of the multimode fibre core to the centre of the optical radiation emitted from the transmitter is approximately 23 um to approximately 30 um (Fig's. 4 and 5 show that the offset can be changed as desired and includes the range from 23 um to 30 um.)

The suggestion/motivation is the same as that used in the rejection for claim 30.

As to **Claim 21**, *Cunningham* discloses wherein the multimode fiber is installed in a building (Col. 1, l. 18.)

The suggestion/motivation is the same as that used in the rejection for claim 30.

As to **Claim 31**, *Farber* discloses a distributed antenna system (Fig. 2, distributed antenna system) comprising:

a multimode optical fibre link comprising multimode optical fiber (Fig. 2, multimode fiber (16)), a laser to provide optical radiation for transmission over the multimode optical fiber (Fig. 3, laser diode (60) for transmission over fiber (16));

and a photodetector arranged to receive optical radiation from the multimode optical fiber (Fig. 5A, photodiode (unlabeled) receives the optical signal from the multi-mode fiber);

an input signal node (Fig. 3, base station (10)) configured to receive a radio-frequency electrical signal consisting of an information signal modulated onto a radio-frequency carrier (Fig. 3, the base station (10) receives an information signal (GSM) modulated onto a RF carrier in the range of (935 to 960 MHz); and

an antenna (Fig. 5A, GSM antenna (28)0,

wherein the laser is configured to be driven directly by the radio-frequency electrical signal Fig. 3, laser (60) is directly modulated) and the photodetector is configured to transduce optical radiation from the multimode optical fiber into the radio-frequency electrical signal for radiation thereof by the antenna (Fig. 5A, optical signal from base unit is converted to RF signal an passed to antenna (28.))

Farber does not expressly disclose using an offset launch.

Cunningham discloses coupling optical radiation of the laser into the multimode optical fiber at an offset (Fig. 1, shows the multimode fiber (6), where radiation (20) is coupled into the fiber at an offset of X), the offset being selected to provide a stable operating regime for both amplitude and phase in the face of imperfections in the refractive index profile of the core (Fig's 4 and 5 show that an offset launch in the range of 20-30 um yields a bandwidth gain while avoiding

excessive loss; Applicant's Specification (p. 8, ll. 19-20) states that the most stable region of operation is at an offset between 10 and 30 um; therefore, selecting an offset in the range disclosed by *Cunningham* achieves the claimed result of providing a stable operating regime for both amplitude and phase in the face of imperfections in the refractive index profile of the core.)

At the time of the invention it would have been obvious for a person of ordinary skill in the art to use the offset launch technique disclosed by *Cunningham* in the distributed antenna system disclosed by *Farber*. The suggestion/motivation would have been to improve the bandwidth and modal noise performance of the multimode system (Col. 3, ll. 45-50.)

As to **Claim 23**, *Cunningham* discloses wherein the transmitter is a transverse mode laser transmitter (Col. 8, l. 49.)

The suggestion/motivation is the same as that used in the rejection for claim 31.

As to **Claim 24**, *Cunningham* discloses wherein the launch restricts the number of modes excited in the fibre (Col. 3, ll. 35-7.)

The suggestion/motivation is the same as that used in the rejection for claim 31.

As to **Claim 25**, *Cunningham* discloses wherein the launch is collinear with an axis of the multimode fibre (Fig. 10.)

The suggestion/motivation is the same as that used in the rejection for claim 31.

As to **Claim 27**, *Farber* discloses a SAW filter demodulator (Fig. 5A, 280) that demodulates the output of the photodetector.

As to **Claim 28**, *Cunningham* discloses wherein the multimode fibre has a core diameter of 62.5 um (Col. 7, ll. 12) and wherein the coupling step comprises using a launch having an offset distance measured from the centre of the multimode fibre core to the centre of the optical radiation emitted from the transmitter of approximately 10 um to approximately 30 um (Fig's. 4 and 5 show that the offset can be changed as desired and includes the range from 10 um to 30 um.)

The suggestion/motivation is the same as that used in the rejection for claim 31.

As to **Claim 29**, *Cunningham* discloses where the offset distance measured from the centre of the multimode fibre core to the centre of the optical radiation emitted from the transmitter is approximately 23 um to approximately 30 um (Fig's. 4 and 5 show that the offset can be changed as desired and includes the range from 23 um to 30 um.)

The suggestion/motivation is the same as that used in the rejection for claim 31.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G. DOBSON whose telephone number is (571)272-9781. The examiner can normally be reached on 7-4 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DANIEL G DOBSON/
Examiner, Art Unit 2613
08/20/2010

/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613